

1.0 INTRODUCTION

This report summarizes results of field inspections conducted during construction of the Muscoy Operable Unit (OU) 19th Street Plant granular activated carbon (GAC) vessels. The inspections were performed by URS Group, Inc. (URS) for the United States Environmental Protection Agency (EPA) under Contract No. 68-W-98-225 and Work Assignment No. 069-RARA-09J5.

1.1 SITE BACKGROUND

During a groundwater investigation in 1980, the California Department of Health Services (DHS) discovered chlorinated solvents in municipal supply wells within the northern San Bernardino/Muscoy region of San Bernardino. Several investigations were conducted to locate the potential source(s) of contamination. On March 30, 1989, EPA placed this region on the National Priorities List, thereby releasing federal funds for cleanup of the region, now identified as the Newmark Groundwater Contamination Superfund Site (site). The principal contaminants identified by site investigations were trichloroethene (TCE) and tetrachloroethene (PCE). Reported concentrations of these contaminants exceed federal and California maximum contaminant levels (MCLs) for drinking water in several municipal wells within the San Bernardino and Muscoy areas, including the Newmark Municipal Wellfield.

A remedial investigation and a feasibility study were performed for the site between 1989 and 1994. As part of the Newmark OU remedial design (RD) and remedial action (RA), groundwater treatment systems and extraction wellhead facilities were installed and are currently operating. Design details of these facilities are presented in separate design documents. The Muscoy OU is currently in the RA phase, and this document is part of the RA effort for the Muscoy OU.

1.2 PROJECT DESCRIPTION

The Muscoy Plume OU RA includes construction of 12 series pairs of liquid-phase GAC vessels operating in parallel to treat a design total of 11,600 gallons per minute (gpm). The vessels, located on W. 19th Street, are referred to as the 19th Street Plant. The GAC vessels will remove organic content from groundwater that is pumped through the vessels. After treatment at the 19th Street Plant, the treated water will be conveyed through existing City of San Bernardino Municipal Water Department (SBMWD) transmission pipelines. Excess treated water will be provided to the San Bernardino Valley Municipal Water District (SBVMWD) through a new connection and pump station located near Encanto Park on W. 19th Street.

The scope of work included the fabrication and installation of the GAC vessels at the 19th Street Plant. U.S. Filter Westates (USFW) was contracted by URS to complete the scope of work. URS was the prime contractor, responsible for performing construction management and inspection services.

2.0 CONSTRUCTION SUMMARY

This section provides a chronology of construction activities (Section 2.1), describes the results of quality assurance tests (Section 2.2), and provides additional information related to completion of the construction project.

2.1 MONTHLY SUMMARIES

The following construction highlights describe the fieldwork completed each month, important issues that arose during the month, and the issues' resolution. Detailed Weekly Construction Progress Reports prepared by the URS Construction Manager, Matt Dwyer, are included as Appendix A; detailed Inspector's Daily Reports prepared by the URS Resident Inspector, Nick Reylek, are included as Appendix B. Internal and external coating inspection reports are included as Appendix C.

USFW began vessel fabrication in August 2003. Interior coating inspections were performed by V&A Consulting Engineers, Inc. (V&A), under contract with URS, in September and October 2003 and January and April 2004, at the manufacturing and USFW fabrication facilities in Fresno and Red Bluff, California. V&A performed exterior coating inspections at the 19th Street Plant in July and August 2004. The field construction activities began with the GAC vessel installation work in the week of May 25, 2004, and continued through the completion of the hydrostatic pressure testing and vessel labeling on March 20, 2005. URS personnel visited the USFW fabrication facility in Red Bluff, California on January 6, 2004, and April 9, 2004, to inspect the vessel construction activities and to coordinate the vessel delivery schedule with the 19th Street Plant construction activities. The inspection notes for both site visits are included in Appendix A with the Weekly Construction Progress Reports.

Construction Highlights:

August 2003

- USFW initiated GAC vessel construction. Fabrication of the vessels is performed at the Modern Welding Fabrication manufacturing facility in Fresno, California.

September–October 2003

- V&A performed independent interior vessel coating inspections of the GAC vessels from September 29, 2003, to October 17, 2003. The vessels were located in the Modern Welding Fabrication manufacturing facility in Fresno, California. The inspection results are detailed in the V&A letter dated February 13, 2004, which is included in Appendix C.

January 2004

- V&A performed independent interior vessel coating inspections of the GAC vessels from January 7, 2004, to January 15, 2004. The vessels were located in the Modern Welding Fabrication manufacturing facility in Fresno, California. The inspection results are detailed in the V&A letter dated February 13, 2004, which is included in Appendix C.

- URS inspected vessel construction progress at the USFW facility in Red Bluff, California.

January 2004–May 2004

- The completed vessels were shipped to the USFW facility in Red Bluff, California, for final assembly and interconnecting piping manufacturing.

April 2004

- V&A performed independent interior vessel coating inspections of the GAC vessels from April 28, 2004, to April 30, 2004. The vessels were located in the USFW facility in Red Bluff, California. The inspection results are detailed in the V&A letter dated May 10, 2004, which is included in Appendix C.
- URS inspected vessel construction progress at the USFW facility in Red Bluff, California.

May 2004 (Weekly Report 13)

- V&A performed independent interior vessel coating inspections of the GAC vessels from May 19, 2004, to May 21, 2004. The vessels were located in the USFW facility in Red Bluff, California. The inspection results are detailed in the V&A letter dated June 3, 2004, which is included in Appendix C.
- USFW delivered and placed the GAC vessels and header piping for the east side of the 19th Street Plant, San Bernardino, California, on the concrete pads on May 24, 2004.

June 2004 (Weekly Report 17)

- USFW delivered and placed the GAC vessels and header piping for the west side of the 19th Street Plant on the concrete pads on June 22, 2004.

July 2004 (Weekly Reports 18–21)

- USFW installed the anchor bolts on the east and west sides of the 19th Street Plant on June 30, 2004.
- USFW began repairs on the internal vessel coatings on July 2, 2004. Internal vessel coating repairs were completed on July 21, 2004. Repairs were reinspected and accepted by V&A.
- V&A performed independent exterior vessel coating inspections on the first group of the GAC vessels on July 7, 2004, through July 9, 2004. The inspection results are detailed in the V&A letter dated July 19, 2004, which is included in Appendix C.
- V&A performed independent exterior vessel coating inspections on the remainder of the GAC vessels on July 20, 2004, through July 21, 2004. The inspection results are detailed in the V&A letter dated August 26, 2004, which is included in Appendix C.

August 2004–December 2004

- No work was performed on the GAC vessels.

January 2005 (Weekly Reports 46–48)

- USFW started hydrostatic pressure testing the vessels on January 13, 2005. Pressure testing was completed on January 19, 2005.
- USFW began cleaning and preparing the vessels for external paint touch up on January 20, 2005. Cleaning and preparing the vessels was completed on January 26, 2005.
- USFW began touching up external vessel paint on January 25, 2005.

February 2005 (Weekly Reports 49 – 50)

- USFW completed touching up external vessel paint on February 1, 2005.
- USFW began chlorination of the vessels and associated piping on February 1, 2005. Chlorination of the GAC vessels was completed on February 4, 2005.

March 2005 (Weekly Reports 53–57)

- USFW completed the lettering and labels on the vessels on March 15, 2004.

May 2005

- URS and SBMWD performed a shakedown test of the 19th Street Plant system, including GAC vessels, on May 18 and May 19, 2005.

July 2005

- URS, SBMWD, and EPA determined the 19th Street Plant system, including GAC vessels, to be operational and functional on July 25, 2005. The final inspection of the 19th Street Plant, including the GAC vessels, was performed on July 27, 2005.

April 2005–October 2005

- USFW completed punch list items.

2.2 QUALITY ASSURANCE TESTING SUMMARY

Quality assurance test results are discussed in this section, with supporting documentation provided in appendices.

Internal Coating Inspections

Internal coating inspections were performed by V&A inspectors Chris Kincheloe and Craig Williams on two of the GAC vessel pairs at the Modern Welding and Fabrication facility in Fresno, California. Additional interior coating inspections were performed by V&A inspectors Craig Williams and Jim Wiggins on the remaining 10 GAC vessel pairs at the USFW facility in Red Bluff, California. Dry film thicknesses were recorded and mapped throughout the vessels. Locations where film thicknesses were too high or too low were marked. Spark testing was conducted and holidays were identified and marked for repair. Internal coating repairs performed by USFW were observed by V&A inspector Tom Neelings on the vessels located at the 19th Street Plant site in San Bernardino, California. Internal coating inspection reports generated by V&A are included in Appendix C.

External Coating Inspections

External coating inspections were performed by V&A inspector Tom Neelings on the GAC vessel pairs after delivery to the 19th Street Plant site in San Bernardino, California. Several areas were indicated where the prime coat was showing through the finish coat. Installation and transportation damage and holidays were identified and marked for repair. URS Resident Inspector Nick Reylek observed the external coating repairs performed by USFW. External coating inspection reports generated by V&A are included in Appendix C.

Hydrostatic Testing, Chlorination, and Flushing

Pressure testing of the GAC vessels was performed by the manufacturer (Modern Welding and Fabrication). Manufacturer vessel certifications are included as Appendix D. Hydrostatic tests were performed by USFW on the GAC vessels after all associated piping and valve connections were completed. Initially the vessels were filled with pressurized air to minimize the amount of water lost due to leaks at joints and fittings. A soap and water mixture was applied to all the joints to allow for visual inspection of leakage, and any joint with air bubbles was tightened. Then one vessel pair at a time was filled with water from the backwash supply pipeline and the vessel pair was pressurized to 75 pounds per square inch (psi) continually for 15 minutes. If no leaks were found, the test water was transferred to the next vessel pair and the process was repeated for all 12 pairs. All 12 pairs of vessels passed the hydrostatic tests. The testing operation was observed by URS Resident Inspector Nick Reylek. The hydrostatic testing procedures and sign-off forms are included in Appendix D.

Upon successful completion of hydrostatic testing, the pipeline sections and vessels were flushed and disinfected. Backwash supply water was used to flush and fill all 12 vessel pairs. Chlorine was introduced into the vessels filled with water. The chlorine concentration was specified to be maintained between 25 and 50 parts per million (ppm), and this mixture was retained inside the vessels for at least 12 hours. Following chlorination, all water remained in the vessels and pipeline until carbon was delivered.

Bacteria Testing

USFW collected a water sample from each of the GAC vessels and had the samples analyzed for the presence of coliform bacteria. Samples from all GAC vessels showed favorable test results. Copies of these test results are included in Appendix E.

Flow Meter Calibration

The flow meters were calibrated by the manufacturer. Copies of the flow meter calibration test records are included in Appendix F.

2.3 SAFETY AND HEALTH

Transporting large GAC vessels on freeways and busy city and residential streets and placing the vessels on the concrete pads at the treatment plant presented numerous challenges to field crews. As such, the project was performed with a high degree of concern for the safety and health of the work force and the general public. USFW held weekly tailgate safety meetings to enforce safe work practices and discuss potential safety concerns of the crews and local residents.

2.4 COMMUNITY RELATIONS

Due to the sensitive nature of relations with the local residential community, URS worked with Jackie Lane/EPA and Russell Smith/SBMWD to develop a proactive approach to community relations during the GAC vessel installation work. During the installation of the GAC vessels, no issues that were raised by the local residents.

2.5 CHANGE ORDER SUMMARY

The subcontract modifications during the construction of the vessels resulted in a 1.62% increase in the subcontract value to USFW. The following is a listing of the change orders:

| CO # | Description | Amount |
|-------------|---|---------------|
| 1 | Install additional pressure-indicating transmitter on influent and effluent header. | \$3,100.00 |
| 2 | Shorten effluent backwash laterals by 3 feet to widen distance between two vessel trains. | \$3,000.00 |
| 3 | Provide single and triple sample port collection basins for each carbon vessel, per request from SBMWD. | \$20,925.00 |

2.6 CONSTRUCTION PHOTOGRAPHS

Appendix G contains the photographs taken by URS Resident Inspector Nick Reylek during the installation of the GAC vessels. The 17 photographs document the progress of the GAC vessel and vessel header piping construction from start to completion.

2.7 FINAL INSPECTION

A pre-final inspection checklist, punch list, and a shakedown checklist for the entire 19th Street Plant were used to track the GAC vessel project. The items on these checklists were verified as completed by Bob Kemmerle of E2 Consulting (E2), on behalf of EPA, and by various SBMWD personnel, including Mike

Lowe and Terry Tonn. Final inspection of the entire 19th Street Plant construction project with exceptions was conducted on July 28, 2005. Kim Hoang/EPA, Stacey Aldstadt/SBMWD, Bill Bryden/SBMWD, Bob Kemmerle/E2, Dwayne Deutscher/URS, Matt Dwyer/URS, Adam Harvey/URS, and Nick Reylek/URS were in attendance to review the work, list any outstanding issues, and give formal acceptance of the project with the list of exceptions. A copy of the signed Final Inspection and Acceptance Form with noted exceptions is included in Appendix H. Also included Appendix H is the Installation Certification provided by USFW.

The 19th Street Plant, including the GAC vessels, was determined to be operational and functional on July 25, 2005.

2.8 CONCLUSION

The GAC vessel installation project was completed safely and according to the plans and specifications. GAC vessel specifications are included in Appendix I. Record drawings of the completed GAC vessels have been prepared and are included in Appendix J.